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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/069,011	03/14/2002	William John Macklin	MACKLIN-03211	4530

7590 06/25/2004

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EXAMINER

MERCADO, JULIAN A

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 06/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/069,011

Applicant(s)

MACKLIN ET AL.

Examiner

Julian Mercado

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☒ Claim(s) 1 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Objections

Claim 1 is objected to because of the following informalities:

- a. In claim 1 at line 4, "aluminium" in line 4 and line 5 requires changing to --aluminum--.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 1 recites that the metal or metalloids "can form alloys reversibly with lithium over a range of compositions" in line 5-6 of the claim. This feature is understood as being based on the metal or metalloids functioning as an intercalation compound, with the intercalation of lithium being reversible. Lithium intercalation, therefore, is not believed to proceed via alloy formation but instead as an ionic interaction. Thus, the claimed formation of alloys reversibly with lithium is not considered enabling by the present claims.

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Claims 2-6 are rejected under 35 U.S.C. 112, first paragraph as being dependent upon a rejected base claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Che et al. (*Nature* **393**, 346-349 (28 May 1998); doi: 10.1038/30694) in view of Green et al. (U.S. Pat. 6,090,363)

Che et al. teaches a lithium secondary battery wherein the anode comprises carbon nanotubes [1]. To the extent that the claimed invention is understood by the examiner for the reasons discussed under 35 U.S.C. 112, first paragraph (discussion above), Che et al. teaches a metal such as Fe contained within the nanotubes which reversibly intercalates with lithium as follows:

Because the anode material of choice for such batteries is carbon, we were interested in learning whether the carbon-tubule membranes can reversibly intercalate Li⁺, and if Fe-catalysed nanotubules contained within (Fig. 1c) add an extra increment of Li⁺ intercalation capacity. (page 2 of supplied copy)

Che et al. does not explicitly teach a metal or metalloid of the present Markush group. However, Green et al. teaches aluminum (Al), *inter alia*, as a material deposited within an open-ended carbon nanotube. (col. 2 line 6 et seq.) The skilled artisan would find obvious to modify Che et al.'s invention by employing aluminum in view of Green et al.'s disclosure that this

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element has ferromagnetic properties (line 13 et seq.), therefore, it would not require undue experimentation to substitute Al for Fe having shown herein that these elements are art-recognized equivalents for ferromagnetic, catalytic materials.

Claims 2, 3, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Che et al. in view of Green et al., and further in view of Saidi (U.S. Pat. 5,561,007).

The teachings of Che et al. and Green et al. are discussed above.

Che et al. does not explicitly teach a polymeric binder and plasticising solvent. However, Saidi teaches a polymeric binder and plasticising solvent as part of a carbon intercalation anode's composition. (col. 7 line 58 to col. 8 line 8) Thus, the skilled artisan would find obvious to further modify Che et al.'s invention by employing a polymeric binder and plasticising solvent. The motivation for such a modification would be to form a bound porous composite anode body.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Pat. 5,457,343 to Ajayan et al. teaches a carbon nanotube filled with a metallic material. (col. 3 line 21-35)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian Mercado whose telephone number is (571) 272-1289. The examiner can normally be reached on Monday through Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



jam



Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700